

IN THE SPECIFICATION:

[0012] Advantageous embodiments of the present invention are now described in detail with reference to the drawings. FIG. 1 shows a process of locating position for a mobile communication device according to an advantageous embodiment of the present invention. As shown in FIG. 1, starting in step S101, and continuing at step S102, a user inputs a geo-related text through a mobile communication device, such as a WAP-enabled phone and a PDA. The geo-related text could be a street name, a building name, a postal code and a telephone number. At step S103, the geo-related text inputted by the user is formalized into a vector of geo-indicators (G_{i-1} , G_{i-2} , . . . , G_{i-n}), where G_{i-j} could be a street name, a building name, a postal code and a telephone number. The number of geo-indicators n is preferably 1-3. It should be noted that G_{i-j} could be an abbreviation of an exact name. Supporting abbreviation is a key feature of LBT of the present invention, which can largely simplify the character-inputting task in a mobile phone, especially in Chinese character context. At step S104, the geo-indicators are transmitted to a back end server. After receiving the geo-indicators, in step S105, the back end server generates a candidate feature set (CFS) for each geo-indicator by applying geocoding. This step is based on the mapping of a text address to a geo-location based on a back end spatial database. In this step, an important task is to expand a received abbreviation to obtain several potential candidate features (CF). CFS could be a set of points determined by an abbreviated building name,

a set of lines determined by an abbreviated road name, or a polygon determined by a postal code or a prefix of a telephone number which always show regional characteristics. At step S106, each CFS is labeled with a confidence level which is the quantity computed from corresponding CF data set in the spatial database. At last, at step S107, the final geo-location information is determined by geocustering the candidate feature set. The geometry relationship (such as distance, contain, intersect, etc.) and the confidence level are taken into account when geocustering the candidate feature set. The geocustering algorithm exploits the spatial database spatial functions and selects a result feature in the winning cluster that is transmitted by the user in step S108 and the process ends in step S109.

[0013] As above, the process of locating position for a mobile communication device according to an advantageous embodiment of the present invention has been described with reference to FIG. 1. A system for locating position for a mobile communication device will now be described with reference to FIG. 2. As shown in FIG. 2, the system is formed of two parts: a plurality of mobile communication devices and a back end server. In one of the plurality of mobile communication devices (such as a WAP-enabled phone and a PDA), the user inputs a geo-related text. The geo-related text inputted by the user is formalized into a vector of geo-indicators (Gi-1, Gi-2, . . . , Gi-n) by a geoindicator generator S202. The generated geo-indicators (Gi-1, Gi-2, . . . , Gi-n) are transmitted to a back end server via a wireless channel. In the back end server, geo-location generating means 203 generates a candidate feature set (CFS) for each geo-indicator by applying geocoding. The geo-location generating means maps the text address to a geo-location based on the back end

spatial database. Each CFS is labeled with a confidence level according to the corresponding CF data set in the spatial database. Clustering means 204 geoclusters the candidate feature set. CFS could be a set of points determined by an abbreviated building name, a set of lines determined by an abbreviated road name, or a polygon determined by a postal code or a prefix of a telephone number which always show regional characteristics. The clustering means 204 takes into account the geometry relationship (such as distance, contain, intersect, etc.) and confidence level when geoclustering the candidate feature set. The final geo-location information is determined by the back end server, and is transmitted to the user of the mobile device via a wireless channel.

[0014] FIG. 3 is a flow chart illustrating a process of locating position for a mobile communication device according to another advantageous embodiment of the present invention. A user may input one geo-indicator which implies multiple locations. It's a usual case in Chinese abbreviations. In such a case the user's choice may be feedback, the geomarching engine then can refine its geoindicator dictionary. For instance, it can add new indicators, index the geoindicator dictionary with the frequency of being used in history, or even provide a tailored dictionary for each user respectively. The feedback mechanism makes geomarching engine more intelligent and adaptable to locate users more precisely. Steps S301, S302, S304, S305 S306, S307 are the same as steps S101 - S307 in Figure 1. As shown in FIG. 3, if the system determines the generated geo-location information is not unique at step S308, then the user either makes a choice in step S309 or inputs an additional

geo-indicator in step S310. Steps S311 and S312 correspond to steps S108 and S109.